

Cirripectes chelomatus,
a new species of salarine fish
(Pisces, Blenniidae)

by Jeffrey T. WILLIAMS and Louis André MAUGÉ

Abstract. — A new species of blenniid fish, *Cirripectes chelomatus*, is described from eastern Australia, Papua-New Guinea, Fiji Islands, Tonga Islands, Vanuatu, Loyalty Islands, New Caledonia, and Lord Howe Island. It is distinguished from other species of *Cirripectes* by a combination of the following major characters : a unique color pattern consisting of small spots (about 1.0 mm diameter, purplish-red to dark brown in life) on posterior two thirds of body ; slight notch in membrane between spinous and segmented-ray parts of dorsal fin ; pelvic-fin elements 1,4 ; dorsal-fin rays 14-16 (mode 15) ; anal-fin rays 15-17 (mode 16) ; lateral line incomplete ; caudal vertebrae 19-21 (mode 20) ; and a reduced number of cephalic sensory pores.

Résumé. — *Cirripectes chelomatus*, nouvelle espèce de blennie, est décrite d'Australie orientale, de Papouasie et Nouvelle-Guinée, des îles Vanuatu, Fidji, Tonga, Loyauté et Lord Howe. Elle se distingue des autres espèces de *Cirripectes* par la combinaison des caractères majeurs suivants : un seul type de livrée formé par de petits points (environ 1,0 mm de diamètre, de coloration rouge pourpre à brun foncé sur le vivant) sur les deux tiers postérieurs du corps ; une légère encoche à la membrane entre les parties épineuse et molle de la nageoire dorsale ; nageoire pelvienne 1,4 ; rayons de la nageoire dorsale 14-16 (mode 15) ; rayons de la nageoire anale 15-17 (mode 16) ; ligne latérale incomplète ; vertèbres caudales 19-21 (mode 20) ; et un nombre réduit de pores sensoriels céphaliques.

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INTRODUCTION

The salarine genus *Cirripectes* comprises a group of herbivorous fishes found on coral reefs and rocky bottoms throughout the tropical Indo-Pacific region. Although specimens of *Cirripectes* are relatively common in museum collections, the genus has not been revised, and numerous taxonomic problems exist (see CARLSON, 1981, for a review of previous literature). While working on a revision of the genus, the first author learned of the second author's intention to describe a new species of *Cirripectes*. Since we were both working on the same species, we decided to jointly describe the new form, the result being the description of *C. chelomatus* herein.

METHODS

Counts generally follow SMITH-VANIZ and SPRINGER (1971). In addition, the counts of nasal, supraorbital and nuchal cirri include all free tips on both sides on each specimen. Counts of lip crenulae (papillae) and predorsal commissural pores follow SPRINGER (1967). Abbreviations for the cephalic sensory pore system (fig. 1) are : IFO, infraorbital ; MD, mandibular ; POP, preopercular ; SO, supraorbital (includes the supraorbital [interorbital] commissural pore and the pores on the left side to and including the pore beneath the anterior nostril) ; and ST, supratemporal (those pores above the dorsalmost POP pore and the first lateral-line (LL) pore, to and including the predorsal commissural pores). The first LL pore is the one immediately above the upper end of the gill opening. The first ventrally directed branch of the LL is referred to herein as the supracleithral branch (SB) canal. The number of LL tubes includes only unconnected, bipored tubes on the left side (tubes begin at about mid-length of body and at the end of the continuous part of the LL canal). The position of the end of the LL is given relative to the base of the dorsal-fin spine or segmented ray above, or immediately anterior to (if the tube is between two elements), the last LL tube, or the end of the continuous LL canal if there are no distinct tubes.

The position of the last three anal-fin pterygiophores is given as a formula representing the number of pterygiophores occupying the last three pterygiophore-occupied interhemal spaces (1-1-2 means that there is one pterygiophore in each of the two anterior of the spaces and two in the last space). Pterygiophore arrangement together with vertical fin-ray, vertebral, and rib counts were taken from radiographs.

All measurements were taken using needle-point dial calipers and recorded to the nearest 0.1 mm and generally follow SPRINGER (1967). In addition, height of the membrane under the dorsal notch is the distance between the base of the last dorsal spine and the point of attachment of the fin membrane to the anterior edge of the first segmented dorsal ray. Care must be taken to avoid tearing the membrane.

The following institutional abbreviations are used to indicate the location of material examined : AMS, Australian Museum, Sydney (catalog numbers with the prefix I) ; ANSP, Academy of Natural Sciences of Philadelphia ; BMNH, British Museum (Natural History), London ; BPBM, Bernice P. Bishop Museum, Honolulu ; CAS, California Academy of Sciences, San Francisco ; LACM, Natural History Museum of Los Angeles County ; MNHN, Muséum national d'Histoire naturelle, Paris ; ROM, Royal Ontario Museum, Toronto ; UF, Florida State Museum, Univ. of Florida ; USNM, National Museum of Natural History, Washington, D.C. ; WAM, Western Australian Museum, Perth (catalog numbers with the prefix P).

***Cirripectes chelomatus* n. sp.**

(Figs. 1, 2)

HOLOTYPE : AMS I.21495 — 027 (male), Lady Musgrave Reef, Queensland, Australia, 23°55' S, 152°24' E, 20 Feb. 1980.

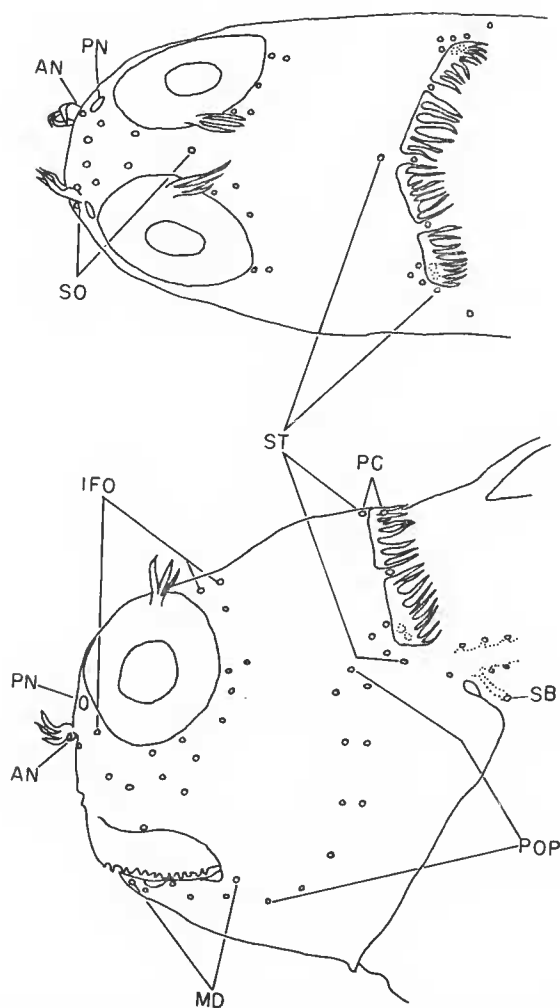


FIG. 1. — Semi-diagrammatic illustration of the cephalic sensory pore series of *Cirripectes chelomatus*. Abbreviations : AN, anterior nostril ; IFO, infraorbital series ; MD, mandibular series ; PC, predorsal commissural pores ; PN, posterior nostril ; POP, preopercular series ; SB, supracleithral branch ; SO, supraorbital series ; ST, supratemporal series. First and last pores in each series are indicated.

PARATYPES : **Australia**, Queensland (localities arranged from north to south) : Sir Charles Hardy Island, 11°55' S, 143°27' E, 0-6 m : AMS 1.20770-071 (4) ; Lizard Island : ROM 40368 (2) ; Lizard Island, 14°40' S, 145°27' E, 2-7 m : AMS 1.19473-205 (13) ; Eagle Island, 14°42' S, 145°24' E, 3-5 m : AMS 1.19444-036 (1) ; Endeavour Reef, 1.5-4.5 m : ANSP 109717 (6) ; Endeavour Reef, 1.2-2.5 m : ANSP 147659 (1) ; Halifax Reef, 6 m : AMS 1.21490-032 (1) ; Heron Island, 23°30' S, 152°05' E (last lot collected at 7.5-9 m, other collection depths unknown) : BPBM 28196 (1), 28197 (2), AMS 1.15482-011 (2), USNM 228298 (3), 228300 (1), 228301 (5), 228302 (11), 228303 (4), 228306 (3), 228308 (9), 228309 (2) ; One Tree Island, 23°30' S, 152°05' E : AMS 1.15634-029 (1), 1.17109-015 (1), 1.17445-150 (1), 1.19338-008 (4), 1.20205-005 (3), 1.20210-016 (1), 1.20213-007 (1), 1.20464-005

(2), I.20560-014 (1), BMNH 1982.11.3.1 (1), BPBM 14449 (2), 15024 (1), CAS 13832 (10), LACM 33723-20 (1), UF 35398 (2), USNM 228299 (4), 228305 (2), 228310 (44), WAM P.27754-001 (2); Lady Musgrave Reef, 23°55' S, 152°24' E (collected with holotype) : AMS I.21495-056 (1). **Lord Howe Island** : Comet's Hole Lagoon, 31°32' S, 159°04' E, 1-10 m : AMS I.17362-037 (1). **New Caledonia** : MNHN 1983-257 (1), USNM 195783 (1); Noumea, Ducos peninsula : CAS 48957 (1), 48958 (1). **Loyalty Islands** : Maré Island : USNM 228274 (3), 228304 (3). **Tonga Islands** : Neiafu Island, 18°39' 00" S, 174°00' 30" W, 0-16 m : USNM 228291 (4). **Vanuatu** (= New Hebrides) : Efaté Islands, Vila Harbor, 17°44' 03" S, 168°18' 36" E : CAS 48903 (1). **Papua-New Guinea** : Milne Bay District, Basilaki Island, north point, 0-6m : USNM 228307 (4).

ADDITIONAL MATERIAL EXAMINED (not types) : **Fiji Islands** : Viti Levu, Cagilai Island : ROM 40207 (3); reef north of Vuro Island, Great Astrolabe, 18°52' S, 178°20.5' E : USNM 228277 (1), Cagilai, south of Moturiki Island : USNM 235727 (2); Malolo Lailai, 17°47' S, 177°13' W, 0-0.3 m; USNM 235731 (2); reef north-northeast of Malamala Island, 17°44' S, 177°17' W, 0-7.5 m : USNM 235735 (2).

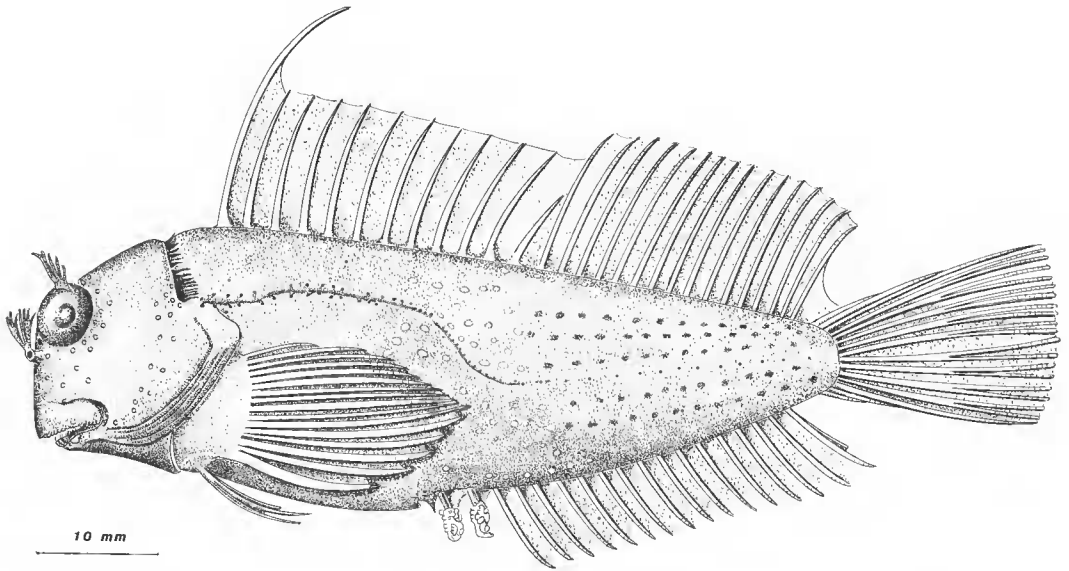


FIG. 2. — *Cirripectes chelomatus* holotype (AMS I.21495-027, male, 65.7 mm SL).

DIAGNOSIS : A species of the genus *Cirripectes* (sensu SMITH-VANIZ and SPRINGER, 1971) distinguished by a combination of the following characters : cephalic sensory system with 1 or 2 pores at each position ; LL incomplete, usually ending beneath segmented dorsal-fin ray 4 or 5 (range from spine XII to ray 10) ; pelvic fin I, 4 ; typically 15 segmented dorsal-fin rays (range 14-16) ; usually 16 segmented anal-fin rays (range 15-17) ; dorsal-fin membrane not deeply notched between spinous and soft parts (membrane usually with very slight notch) ; adult males with first dorsal spine developed into a long, slender filament (females with first spine slightly longer than subsequent spines) ; relatively few nuchal cirri, mode 29 (range 22-45), with some middle cirri frequently arising directly from skin and not connected basally ; last pleural ribs on vertebra 11 ; last epipleural rib(s) on vertebra 16 modally (range 15-18) ; caudal vertebrae 20 modally (range 19-21).

DESCRIPTION

See also table 1. Dorsal fin XII-XIII, 14-16 (mode XII, 15 ; only 2 specimens with XIII, both of which have only 14 rays) ; anal fin II, 15-17 (mode II, 16) ; segmented caudal-fin rays $7 + 6 = 13$; branched caudal-fin rays of adults $4 + 5 = 9$ (damaged rays generally regenerated without branching, counts from specimens with this condition not included) ; dorsal + ventral (= total) procurent caudal-fin rays 10-14 (mode 12) ; pectoral fin 14-16 (mode 15) ; pelvic fin I, 4 ; precaudal vertebrae 9-11 (only 1 specimen with 9 and 2 with 11, out of 136 specimens x-rayed) ; caudal vertebrae 19-21 (mode 20) ; last pleural ribs on vertebra 11 ; last epipleural rib(s) on vertebra 15-18 (mode 16) ; anal-fin pterygiophore arrangement 1-1-2 ; 1-2-1 ; or 2-1-1 (mode 1-2-1).

The following counts are based on a sample of 74 specimens : nuchal cirri 22-45 (mode 29) ; left + right supraorbital cirri 3-12 (mode 8 ; 2 New Caledonia specimens exhibiting abnormal branching with 22 and 93) ; nasal cirri 6-22 (mode 10 ; 2 New Caledonia specimens with 25 and 82) ; 0-8 LL tubes (mode 2) ; LL ends beneath dorsal element XII — 10 (mode 5 ; one specimen with a widely disjunct tube under ray 15) ; upper lip papillae 29-43 (mode 40) ; lower lip plicate laterally, entire mesially ; total gill rakers on first arch 20-28 (mode 26) ; pseudobranchial filaments 6-10 ; 1 canine tooth present posteriorly on each dentary (sometimes broken off at base) ; premaxillary incisiform teeth approximately 200-231 (based on 18 adults) ; dentary incisiform teeth approximately 93-120 (based on 19 adults) ; pharyngeal teeth on each side caniniform, in two rows, outer row with 7 teeth, inner row with 3 slightly larger teeth (based on 5 adults).

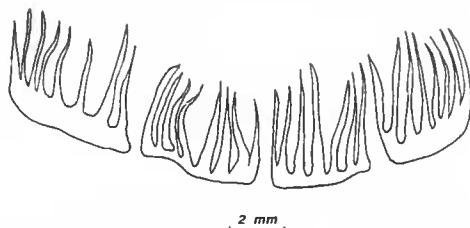


FIG. 3. — General appearance of nuchal cirri of *Cirripectes chelomatus*.

Transverse row of nuchal cirri divided into four groups, two groups on each side of head (fig. 3). Lower group on each side with cirri connected basally by a membrane forming a small flap. Each upper group with row of cirri either arising directly from skin of nape, connected basally by a very narrow membrane, or a combination of these conditions where only a few cirri are connected basally. Groups of cirri are separated from each other by gaps, usually 1 mm or less in length (one gap dorsally, another gap about halfway down length of row on each side). Gaps correspond with presence of branches of ST sensory canal.

Cephalic sensory pore system (fig. 1) relatively simple for *Cirripectes* ; each pore position with 1 or 2 pores (except uppermost POP position that usually has 3) ; predorsal commissural pores 2-4 (usually 1 pore in front of and 2 pores behind nuchal cirri row ; SB

canal with 1-7 pores (mode 2); number of pores along sensory canals variable (except for MD canal that always has 6); SO canal with 6 pore positions, frequently lacking pores at position in middle of snout (second position from front of canal); POP with 6 positions.

Dorsal fin with slight notch in membrane above twelfth spine, height of membrane under notch expressed as percent of length of first dorsal ray, for specimens over 30 mm SL 51.3 — 96.3 (mean 66.3, N = 74), and for specimens under 30 mm SL 44.3 — 52.7 (mean 51.3, N = 5). Adults with dorsal-fin membrane connected to dorsalmost caudal elements for a distance of about 3 mm beyond base of caudal rays (distance increases with size).

Rugosities on the two anal spines of adult males each consist of about 10-15 heavily folded, irregular fleshy ridges. Young males have smaller rugosities with straight ridges that become irregular with increasing standard length (SL). The urogenital orifice of mature males is located basally between two slender, closely appressed filaments (less than 1 mm long) perched on a fleshy swelling behind the anus.

Secondary sexual dimorphism was noted only in the length of the first dorsal-fin spine: spine usually extending 10-15 mm beyond the interspinous membrane of adult males, and typically only 1-5 mm in adult females.

The largest male and female examined are 93.7 and 89.8 mm SL, respectively. No ophioblennius (pelagic stage) postlarvae are known for *Cirripectes chelomatus*, but, since ophioblennius postlarvae have been found for most other species of *Cirripectes* (*pers. observ.* by J. T. W.), it is likely that this species has such a larva. Based on the smallest specimen of *C. chelomatus* examined (19.8 mm SL) it is probable that the ophioblennius stage is not much larger, if any.

Color pattern in alcohol: *Cirripectes chelomatus* males and females have the same color pattern. Head: brown with diagonal streak of tiny (about 0.2 mm diameter), sharply defined, cream-colored spots (sometimes connected to form a narrow line) extending from postorbital area to dorsal edge of upper lip beneath anterior margin of orbit; remainder of cheek usually uniform brown, but some specimens have tiny, sharply defined, cream-colored spots randomly scattered over the cheek; underside of head uniformly brown or tan; nasal and supraorbital cirri brown or tan; nuchal cirri dark brown or black. Body: brown with cream-colored spots of about 1 mm diameter extending across middle third of body, dorsal-most spots on basal third of dorsal fin, ventralmost near anus and on membranes of lower third of anal fin, spots gradually darken posteriorly, becoming dark brown on last third of body; belly and anterior part of body above, behind, and in front of pectoral-fin base uniform brown. Pectoral fins dusky. Pelvic fins brown. Caudal fin dark brown with translucent, triangular wedge located dorsoposteriorly on fin; similar but smaller wedge usually present ventroposteriorly. Dorsal fin with outer margin translucent, remainder of fin dark brown with a few light spots (see above) basally. Anal fin dark brown with indistinct spots (see above) on membranes of basal third of fin. Rugosities on anal spines of adult males light tan.

Color in life: Based on color slides, taken by Victor G. SPRINGER, of an adult male collected at One Tree Island, Australia. Head: brown; spots behind eye and on cheek red; nasal and supraorbital cirri yellowish; nuchal cirri black basally and at tips, with short, yellowish section located in middle of each cirrus; branchiostegal membranes yellowish; iris of eye red. Body: brown with purplish-red spots on middle third; spots

gradually darkening to dark brown posteriorly. Pectoral fin with yellow membranes and tan rays. Caudal fin dark-brown, with yellow, triangular wedge over outer margin of upper and lower rays. Dorsal-fin outer margin, including filamentous dorsal spine, orange-yellow, remainder of fin dark-brown with purplish-red spots on basal third of membranes. Anal fin dark-brown with purplish-red spots. Rugosities on anal spines a dirty-yellow color.

REPRODUCTIVE BIOLOGY : The presence of gravid females in collections made in different months of the year, suggests that the species spawns year-round. At 20 mm SL, small granular ovaries are present, by 32 mm SL, individual eggs are discernable in the ovaries, and gravid females are found at 40 mm SL (0.5 mm diameter eggs).

DISTRIBUTION : *Cirripectes chelomatus* is known to occur on coral reefs and rocky bottoms off eastern Australia from Lady Musgrave Reef (latitude 23°55' S), north to Sir Charles Hardy Island (latitude 11°55' S); Lord Howe Island; Loyalty Islands; Tonga Islands; Fiji Islands; Vanuatu; and Basilaki Island (Papua-New Guinea) (fig. 4). It is represented in collections made at depths of zero to a maximum of 16 m (Tonga Islands), but most specimens were collected shallower than 7 m.

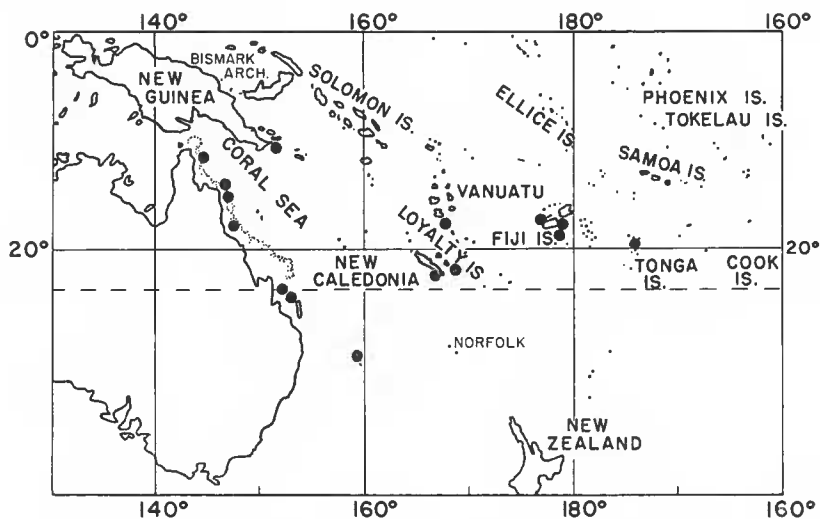


FIG. 4. — Known distribution of *Cirripectes chelomatus*.

GEOGRAPHIC VARIATION : Although frequency distributions (table 1) suggest that there may be geographic differences among different populations, particularly in the number of LL tubes and the location of the end of the LL, the small sample sizes from all but the eastern Australian population make these apparent differences suspect. Additional material is needed to determine how much intrapopulational variation exists before accurate comparisons can be made among populations. Specimens of *Cirripectes chelomatus*

TABLE 1. — Frequency distributions for selected characteristics of *Cirripectes chelomatus*.

	Segmented dorsal-fin rays			Segmented anal-fin rays			Vertebra bearing last epipleural rib				Precaudal vertebrae			Caudal vertebrae		
	14	15	16	15	16	17	15	16	17	18	9	10	11	19	20	21
Great Barrier Reef	7	109	2	2	104	8	19	54	32	3	1	108	2	2 ¹	106	3
Lord Howe Island		1			1			1				1			1	
New Caledonia		2	1		2	1	1	2				3			2	1
Loyalty Islands		5	1		5	1	3	2	1			6			5	1
Tonga Islands		4			4			1	3			4			4	
Fiji Islands	1	9		2	8		2	5	3			10			10	
New Guinea		1			1		1					1			1	
TOTAL	8	131	4	4	125	10	26	65	39	3	1	133	2	2	129	5

	Nuchal cirri (number of free tips)																Anal-fin pterygiophore positions					
	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	1-1-2	1-2-1	2-1-1	
Great Barrier Reef ²					2	5	14	15	6		5	5	3		2	1			25	79	6	
Lord Howe Island								1				1									1	
New Caledonia								1	1				2	1				1			2	1
Loyalty Islands			1					1											1		5	
Tonga Islands	1		1				1	1													4	
Fiji Islands					2	2		1	1	3				1					1		9	
New Guinea													1								1	
TOTAL	1	2	2	2	7	17	18	8	1	8	5	7	2	2	1		1		27	101	7	

	Nasal cirri (total number of free tips on both sides)														Supraorbital cirri (total number of free tips on both sides)											
	6	7	8	9	10	11	12	13	14	15	16	17	18	19	3	4	5	6	7	8	9	10	11	12		
Great Barrier Reef		4	6	5	6	8	7	5	5	5	3	2	1	2				11	12	19	10	2	4			
Lord Howe Island									1											1						
New Caledonia ³															1											
Loyalty Islands	3			1			1				1					1	1	1		1				1		
Tonga Islands			1		2		1											4								

Fiji Islands	1	2	1		2				1		1	1				1	4	2	1		1	1		
New Guinea	1																1							
TOTAL	5	6	8	6	10	8	9	6	5	7	4	3	2	2	1	1	1	18	16	23	11	2	6	1

	Lateral line tubes								Lateral line ends under dorsal spine or ray													
	0	1	2	3	4	5	6	7	8	XII	1	2	3	4	5	6	7	8	9	10		
Great Barrier Reef ⁴		3	17	15	12	5	3	3	1					5	15	21	7	8	1			1
Lord Howe Island					1										1							
New Caledonia			2	1										1	2							
Loyalty Islands ⁵			1			2											2	1				
Tonga Islands				1	2	1							2		1	2						
Fiji Islands	1	1	4	4							1	2	5	2								
New Guinea	1									1												
TOTAL	2	7	23	21	16	5	3	3	1	1	1	4	11	20	26	8	8	1				1

	Upper lip papillae															
	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	
Great Barrier Reef	1	1				1	6	4	7	4	8	5	9	5	4	4
Lord Howe Island									1							
New Caledonia											1	1	1			
Loyalty Islands					1				2		1			1	1	
Tonga Islands								1		1				1		
Fiji Islands				1		2		1	1	2			1	1	1	
New Guinea											1					
TOTAL		1	2		3	1	7	6	12	6	10	8	11	8	5	4

1. Specimens with 11 precaudal vertebrae instead of the usual 10.

2. One specimen with 45 nuchal cirri not included.

3. Three specimens with 22, 25, and 82 nasal cirri, respectively, and two specimens with 22 and 93 supraorbital cirri, respectively, not included.

4. One specimen with the last tube (widely separated from the preceding ones) under ray 15, not included.

5. Three small specimens (19.8-20.8 mm SL), two with one LL tube, and one with no LL tubes. All have LL ending under dorsal spine X, not included.

collected in the Fiji Islands have a more uniform body coloration than specimens from other localities. The body spots are poorly defined on the Fiji specimens, and cannot be discerned on small specimens. Since the size and shape of spots on the cheeks, and other characteristics of these specimens fall within the range of variation for the species, the Fiji population is considered to represent a geographic variant with respect to body color pattern. For this reason, these specimens are not designated as types.

ETYMOLOGY : Derived from the Greek *cheloma*, meaning notch, in reference to the slight notch in the dorsal-fin membrane above the twelfth spine ; here used as a noun in apposition.

COMMENTS

One of the three specimens from New Caledonia (CAS 48958) exhibits extreme branching of the cirri. The number of free tips on the nuchal cirri were too numerous to count ; thus only the bases were counted for this specimen. Each nuchal cirrus is tree-like in shape, having a stout base with a crown of branches. The nasal and supraorbital cirri have more free tips than any other member of the species (i.e. total cirri counts of about 82 and 93, respectively). This specimen also has a high number of dorsal rays (16), anal rays (17), and caudal vertebrae (21), but each of these counts is within the range of variation for the species. Because its color pattern and all other characteristics are typical for *Cirripectes chelomatus*, this specimen is assigned to *C. chelomatus*.

Unlike SPRINGER's (1967) findings for *Entomacrodus*, most of the diagnostic characters recognized in this study are size independent, but three exceptions should be noted. The number of LL tubes and the position of the end of the LL continue to change until the individuals reach a size of approximately 35 mm SL. The three smallest specimens (19.8-20.8 mm SL) have fewer LL tubes (0-1) and a more anterior termination of the LL (beneath dorsal spine X) than most of the other specimens (see footnote 5 of table 1). Also the color pattern changes from a relatively indistinct spotting pattern on individuals smaller than about 35 mm SL, to the distinctive adult pattern on larger individuals.

COMPARISONS : *Cirripectes filamentosus* (Alleyne and Macleay) is the only species of *Cirripectes* that is easily confused with *C. chelomatus*. These species apparently occur sympatrically at Sir Charles Hardy Island, Australia (11°55' S, 143°27' E), where both species were taken in a collection made at a depth of 0-6 m. In the area of sympatry, *C. filamentosus* is easily distinguished from *C. chelomatus* by its pelvic-fin formula of I,3 and its uniform brown body with spotting restricted to cheeks, as compared to the 1,4 count and to the distinctive spotting pattern on the body of *C. chelomatus*. The cheek spots of *C. filamentosus* also differ from those of *C. chelomatus* in being larger, tear-shaped, and poorly defined compared to the tiny, round, sharply defined spots of the latter.

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